Interaction between scion and stock.—MEYER and SCHMIDT[11] have produced a voluminous article on the interchange of substances and mutual influence between stock and scion in a heteroplastic graft. The introduction and review of literature occupy 48 pages, and 33 pages are given to the statement of results and the summary. One is compelled to think that the article could have been advantageously condensed to half the space. The authors mention that interchange of carbohydrates was already fully worked out, while the previous work on movement of aplastic and other substances is very unsatisfactory. They direct their attention to the movement, formation, and storage of alkaloids, using *Nicotiana Tabacum* as scion on *N. affinis* and *Solanum tuberosum* as stocks, and *Datura Stramonium* as scion on *Solanum Lycopersicum* and *S. tuberosum*. They find that alkaloids can pass from scion to stock; but the movement is very slow, and apparently takes place through the parenchyma and not through the sieve tubes. With *N. Tabacum*, normally rich in nicotin, as scion, and *N. affinis*, normally poor in nicotin, as stock, the latter comes to contain many times its normal amount of nicotin, and even ten times as much as the scion; while the scion becomes relatively poor in it. With *S. tuberosum* as stock for *N. Tabacum*, the periderm cells of the former become the main storage tissue for the nicotin. It is most abundant in the tissue of the stock just below the graft, and decreases in amount as the cells are more distant; while in the tuber none at all or only traces appear.—WILLIAM CROCKER.

Living cells and extreme temperatures.—GEORGEVITCH,[12] in investigating the effect of extreme temperatures on living cells, used the root tips of *Galtonia candicans*. They were kept at 40° C., and −5° C., killed and fixed at the same temperature, and the effect of these extremes noted. At a temperature of +40° C., the cytoplasm coagulates and forms small clumps of dark-staining material. At low temperatures the cytoplasm becomes vacuolate, and the coordination in the action of the spindle fibers is broken up, which results in the distribution of chromosomes between the poles. The activity of the kinoplasm is decreased by low temperature and increased by high temperature. There result larger spindles with stronger fibers, more rapid transport of chromosomes, and shortened duration of nuclear division. Thereby cell wall formation is inhibited and binucleate cells are of frequent occurrence. The chromosomes often form chains, due to the irregular transport toward the poles. In cold preparations the nucleus often takes on an amoeboid form, also in the warm, but not to such an extent. In general it can be said that high temperatures favor development of chromatic

[11] MEYER, ARTHUR, and SCHMIDT, ERNST, Ueber die gegenseitige Beeinflussung der Symbionten heteroplastischer Transplantationen mit besonderer Berücksichtigung der Wanderung der Alkaloide durch die Pfropfstellen. Flora **100**:317–396. *figs. 3.* 1910.

[12] GEORGEVITCH, PETER, Ueber den Einfluss von extremen Temperaturen auf die Zellen der Wurzelspitze von *Galtonia candicans*. Beih. Bot. Centralbl. **25**:127–135. 1910.

material, while low temperatures inhibit it. In cold preparations one finds collections of chromatin which stain blue and are called pseudonucleoli. SCHRAUMEN found the same in the cells of shoots of *Vicia Faba* kept at both high and low temperatures. GEORGEVITCH did not find them in warm preparations. In cold preparations the nucleoli show an increase in size, mass, and numbers.—R. CATLIN ROSE.

Fossil Osmundaceae.—KIDSTON and GWYNNE-VAUGHAN[13] have continued their interesting investigations on the fossil Osmundaceae. In the case of the most important of the species which they describe (*Thamnopteris Schlechtendalii* Eichwald) there can apparently be no doubt that they have really to do with the remains of an osmundaceous fern. They find that in this species the center of the stele is marked by the presence of a mass of short tracheids without any admixture of parenchyma, which curiously enough they regard as the equivalent of a pith. It is surely begging the question as to the origin of medullary structures, to regard tissues which admittedly are entirely tracheary and contain not the slightest admixture of parenchymatous cells as equivalent to the medulla of the higher plants. The difficulty of regarding the central mass of short tracheids in *Thamnopteris* as a pith is rendered insuperable, apparently, by the fact that the leaf traces originate from the stele exactly as in those cases where no pith is present, that is without giving rise to any foliar gaps. The views entertained by the present authors and the majority of English writers on anatomy encounter an additional difficulty in that they are quite unable on their hypothesis to explain the presence of internal phloem and internal endodermis in closed steles. These find apparently a very simple and natural elucidation in connection with the reduction theory now advocated by a considerable number of American anatomists.—E. C. JEFFREY.

Bennettitales.—NATHORST[14] has described the more or less complete reproductive apparatus of a number of bennettitean forms. There are three species of *Williamsonia* from the Jurassic beds of Whitby and Scarborough, England. In these were found in different cases both microsporangia with microspores, and seeds. The structure of the microspores is illustrated by admirable photomicrographs. A new genus (*Wielandiella*) has a very remarkable vegetative organization. The stem branches freely in an apparently dichotomous manner and is quite slender. The cones occur in the forkings of the branches. The vegetative structure resembles that of the problematic *Anomozamites*. The cones showed remains of both pollen and seeds. The structure of the microspores of a third genus (*Cycadocephalus Sewardi*) is described. These are remarkable for their close resemblance to fern spores. For comparison, a figure of *Wel-*

[13] KIDSTON, R., and GWYNNE-VAUGHAN, D. T., On the fossil Osmundaceae. III. Trans. Roy. Soc. Edinburgh **46**:1909.

[14] NATHORST, A. G., Paleobotanische Mitteilungen. 8. Handl. Kgl. Svensk. Vetensk.-Akad. **45**: no. 4. 1910.